DP-8800Plus/DP-8600/
DP-9900/DP-9900Plus/DP-9600

Digital Ultrasonic Diagnostic Imaging System

Installation Manual

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Safety Precautions

1. Meaning of Signal Words

In this operation manual, the signal words ⚠ **DANGER**, ⚠ **WARNING**, ⚠**CAUTION** and **NOTE** are used regarding safety and other important instructions. The signal words and their meanings are defined as follows. Please understand their meanings clearly before reading this manual.

Signal word	Meaning
⚠**DANGER**	**Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**
⚠**WARNING**	**Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**
⚠**CAUTION**	**Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**
NOTE	Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

2. Meaning of Safety Symbols

Symbol	Description
	Type-BF applied part All ultrasound transducers can be connected to this system are Type-BF applied parts.
	"Attention" indicates the points requiring attention. Be sure to read the operation manual concerning these points before using the equipment.

3. Safety Precautions

Please observe the following precautions to ensure patient and operator safety when using this system.

⚠DANGER: Do not use flammable gasses such as anesthetic gas, oxygen or hydrogen, or flammable liquids such as ethanol, near this product, because there is danger of explosion.

⚠WARNING:

1. Do connect the plugs of this equipment and its peripherals to the wall receptacles meeting the ratings indicated on the rating nameplate. Using an adapter or multi-functional receptacle may affect the system's grounding performance and thus cause leakage current exceeding safety requirement.

The video printer must be connected to the designated auxiliary power outlet, and the equipment-provided cable for the printer must be used to connect the printer. Otherwise, other cables may cause electric shock.

⚠CAUTION:

1. Precautions concerning clinical examination techniques

(1) This system must be used only by medical personnel fully trained in clinical examination techniques.

(2) This operation manual does not describe clinical examination techniques. Selection of the proper clinical examination technique must be based on specialized training and clinical experience.

NOTE: 1. Do not use the machine in the vicinity of strong electromagnetic field (such as the transformer), which may affect the performance of the monitor.

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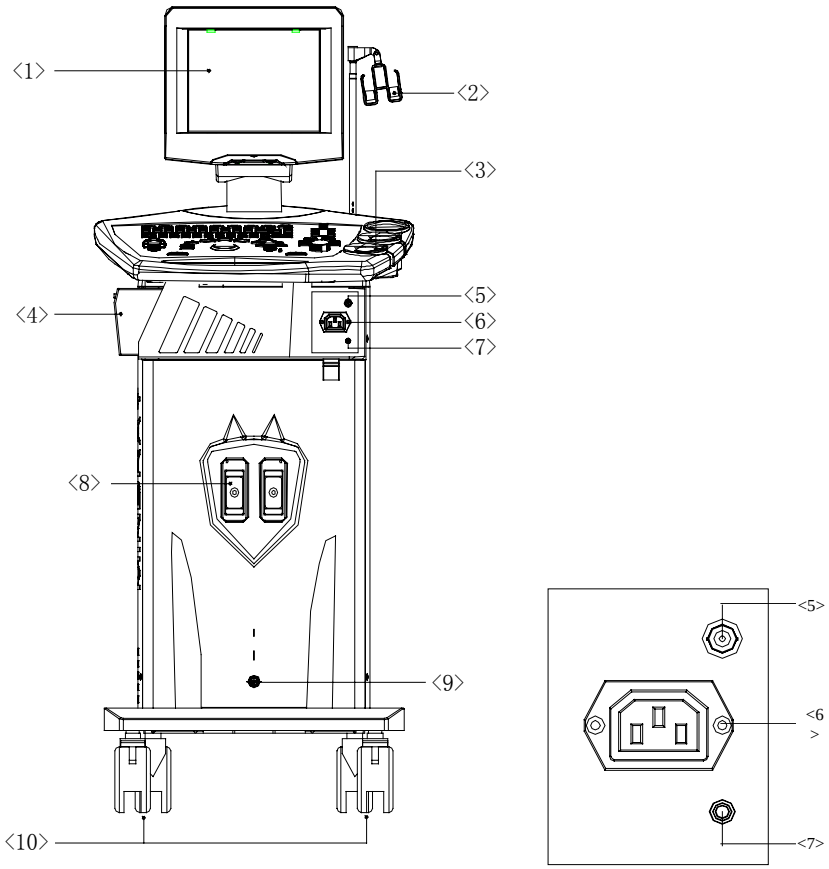
1 Introduction

1.1 Overview

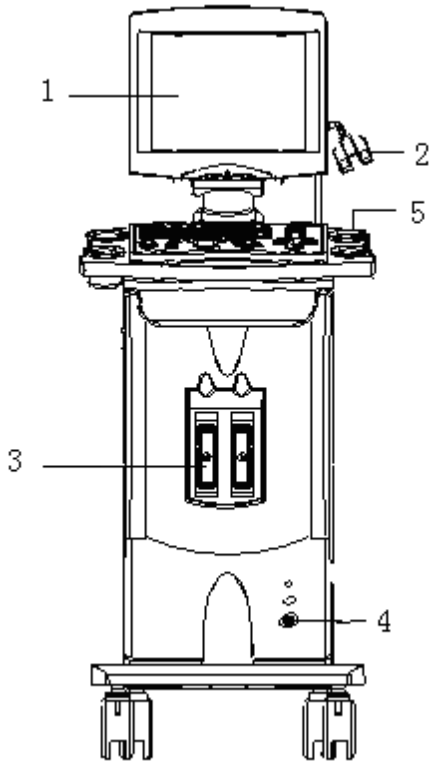
The DP-8800Plus/DP-8600 and DP-9900/DP-9900Plus/DP-9600 diagnostic ultrasound systems are intended for clinical ultrasound examinations.

1.2 Front View



1. Monitor 2. Transducer cable hook 3. Transducer holder 4. Printer compartment 5.Video outlet 6. Auxiliary power outlet 7. Port for video printer 8. Transducer socket 9. Footswitch port 10. Caster

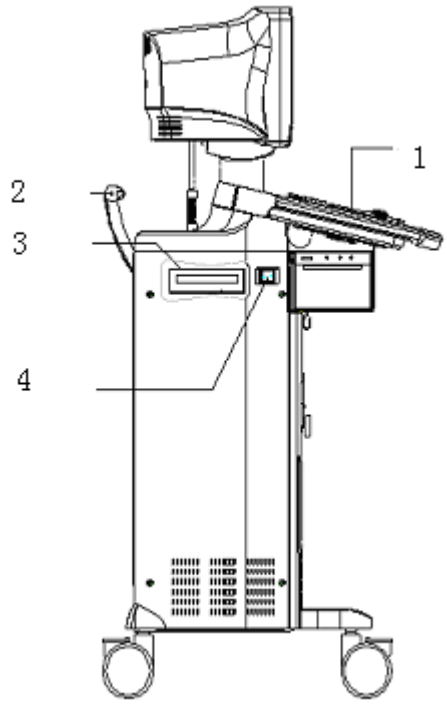
Front view for the DP-8800plus/DP-8600 systems



1. Monitor 2. Transducer cable hook 3. Transducer socket 4. Footswitch port

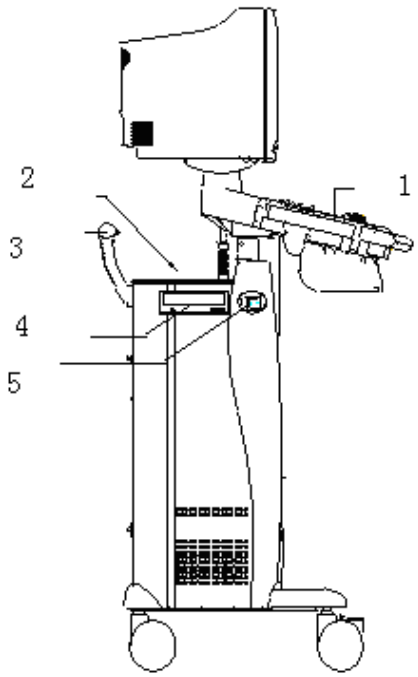
Front view for the DP-9900plus/DP-9600/DP-9900 systems

1.3 Left View



1. Control panel 2. Push handle 3. CD driver 4. Power switch

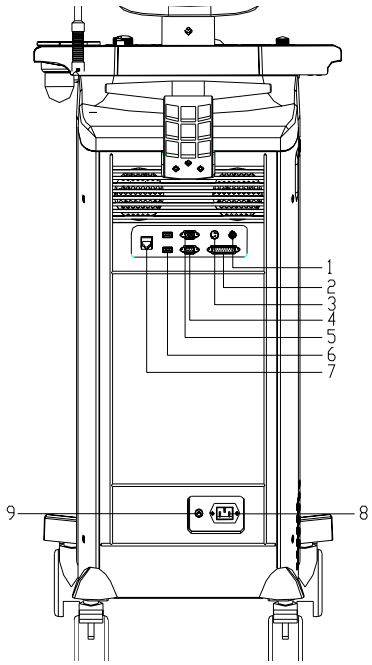
Left view for the DP-8800plus/DP-8600 systems



1. Control panel 2. Top plate 3. Push handle 4. CD writer 5. Power switch

Left view for the DP-9900plus/DP-9600/DP-9900 systems

1.4 Rear View



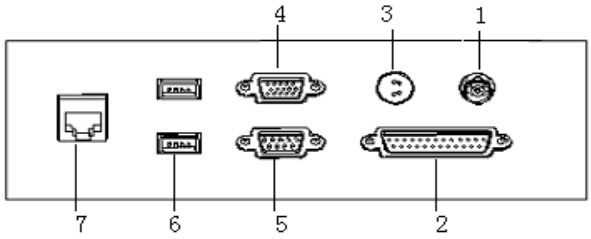


Figure for IO ports

Note: 1. VIDEO 2. Parallel port 3. SVIDEO 4. RS232 5. VGA 6. USB 7. NET 8. Power inlet 9. Ground terminal

Rear view for the DP-8800plus/DP-8600 systems

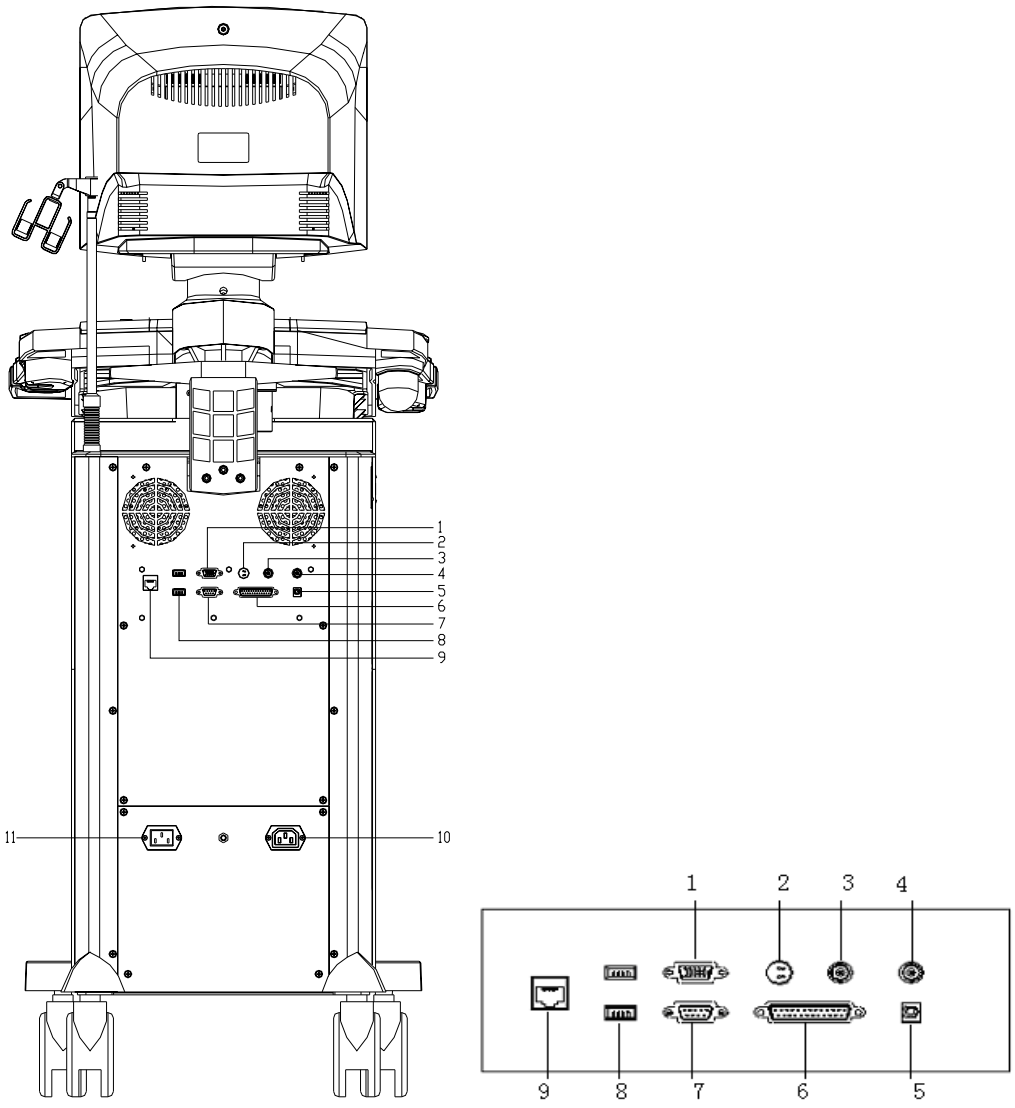


Figure for IO ports

Note: 1. VGA 2. SIVIDEO 3. VIDEO 4. VIDEO 5. REMOTE 6. Parallel port 7. RS232 8. USB 9. NET 10. Power outlet 11. Power inlet

Rear view for the DP-9900plus/DP-9900/DP-9600 systems

2 Installation Requirements

2.1 Power Requirements

1. Voltage: 100-240V～.
2. Frequency: 50/60Hz.
3. Power: 400 VA.

   It is recommended to apply a UPS (uninterruptable power system) with power greater than1000VA.

2.2 Installation Conditions

Do not install the equipment in the environment such as:

1. heat sources
2. high humidity site
3. flammable gases site
4. intense magnetic fields (e.g. nearby a transformer)
5. high-frequency radio waves

2.3 Installation Space

Place the system with necessary accessories in a proper position so as to facilitate operation.

There shall be space of 15cm around the system.

Note: The system shall be kept at least 10cm away from other objects in order to ensure good ventilation.

2.4 Environmental Conditions

1. Ambient temperature: 0℃～40℃;
2. Relative humidity: 25%～90% (no condensation);
3. Atmospheric pressure: 550hPa～1060hPa.

2.5 Ground Requirement

The ground wire of the three-wire power cable is used for the system grounding.

The system shall be grounded according to regulations for the medical electric devices.

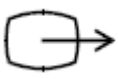
2.6 Storage and Transport Requirements

1. Ambient temperature: -40℃～60℃;
2. Relative humidity: 10% ～ 95% (no condensation);
3. Atmospheric pressure: 500hPa～1060hPa.

2.7 Symbol Description

The following symbols are used for the system and described in the table below.

Table 2-1 Symbol description

	The operation shall be performed according to the operation manual
	Dangerous voltage
	Alternate current
	Equipotential
	Power off
	Power on
	Footswitch
	USB port
	Transducer socket A
	Transducer socket B
	Controlling the video printer
	Video output
	Product serial number

	Product manufacture date
	The system complies with the requirements of EU MDD 93/42/EEC. The code 0123 followed the CE marking represents the code of the EU notified body.

3 Unpacking Checks

3.1 Packing List of the DP-8800 Plus/DP-8600 Systems

After the DP-8800 Plus/DP-8600 systems are unpacked, confirm the objects as follows:

1. Main unit
2. Monitor assembly
3. Accessories: 1 set

Check the objects according to the packing list.

3.2 Peripherals of the DP-8800 Plus/DP-8600 systems

The peripherals of the DP-8800 Plus/DP-8600 systems do not belong to standard configurations.

1. video printer

   SONY UP-895MD

   SONY UP-897MD

   MITSUBISHI P93W

2. graph/text printer

   HP DeskJet 5652/5650/3820 (parallel port/USB port)

   Business Inkjet 1200 (parallel port/USB port)

   HP LaserJet2420d (parallel port/USB port)

   HP DeskJet6548 (USB port)

3.3 Packing List of the DP-9900 Plus/DP-9600/DP-9900 Systems

After the DP-9900 Plus/DP-9600/DP-9900 systems are unpacked, confirm the objects as follows:

1. Main unit

2. Accessories: 1 set

Transducer bracket

Manuals

Check the objects according to the packing list.

3.4 Peripherals of the DP-9900 Plus/DP-9600/DP-9900 Systems

The peripherals of the DP-9900 Plus/DP-9600/DP-9900 systems do not belong to standard configurations.

1. video printer

   SONY UP-895MD

   SONY UP-897MD

   MITSUBISHI P93W

2. graph/text printer

   HP DeskJet 5652/5650/3820 (parallel port/USB port)

   Business Inkjet 1200 (parallel port/USB port)

   LaserJet2420 (parallel port/USB port)

   HP DeskJet6548 (USB port)

4 Tools and Time Required

4.1 Tools Requirement

1. Tool: Philips screwdrivers (big and small).
2. Hexagon wrenches (M5 and M6).

4.2 Time and Manpower Requirement

Time and manpower required: one person and one hour.

5 Installation of DP-8800Plus/DP-8600 Systems

5.1 Installation of Push Handle

1. Lock the four casters.
2. Take out the push handle and three sets of M5x35 hexagon socket screws and washers, and use the hexagon wrench to fix the push handle on the system.

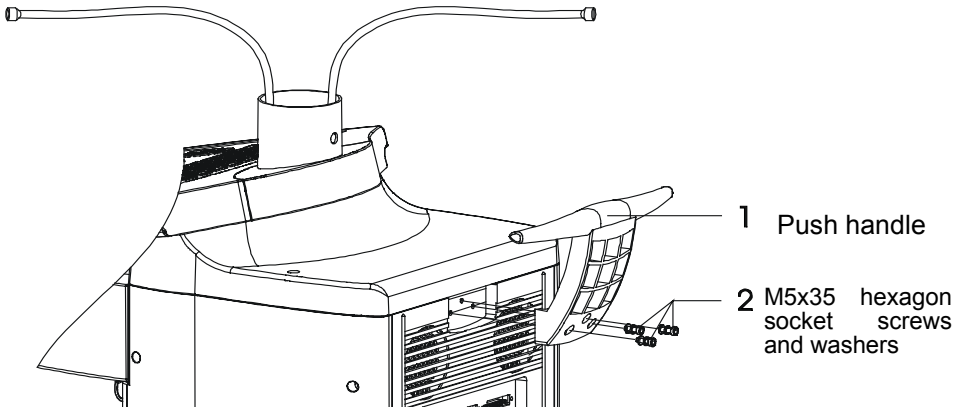


Figure 5-1 Installation of push handle

5.2 Installation of Monitor

1. Press down the buckle to remove the neck cover and place it on the rear cover of the keyboard.
2. Remove the two screws from the bottom of the rear cover of the monitor.
3. Stand behind the monitor, hold the two sides of the rear cover of the monitor, push down the front edge of the rear cover and pull it backward to remove the rear cover.

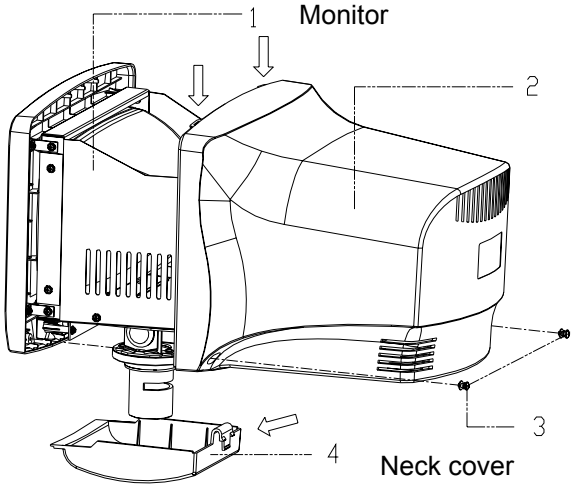


Figure 5-2 Installation of monitor (1)

4. Thread the power cable and signal cable of the monitor through the installation hole.
5. Place the support of the monitor into the sleeve on the keyboard.

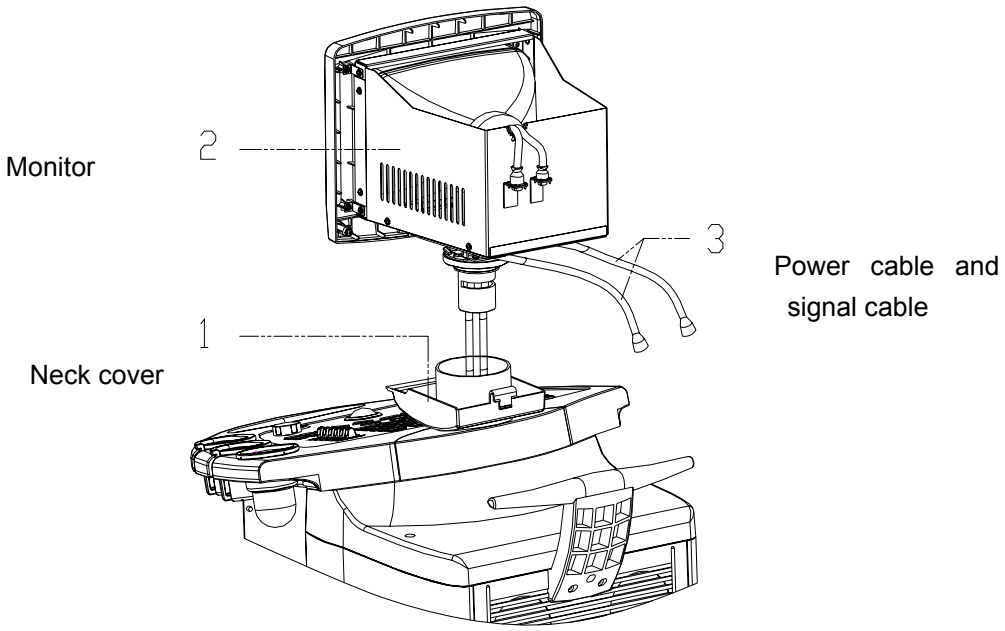


Figure 5-3 Installation of monitor (2)

6. Connect the power cable and signal cable to the corresponding ports at the back of the monitor, and tighten them by nuts.
7. Install the rear cover of the monitor and fit it with the front cover, and then tighten two M4x8 screws at the bottom of the rear cover.
8. Install the neck cover at the bottom of the front cover, and buckle it into the rear cover of the monitor.

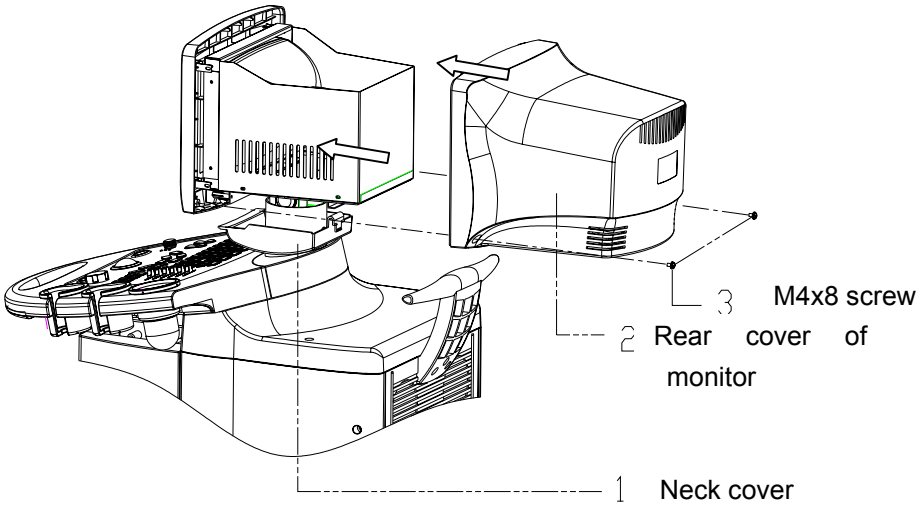


Figure 5-4 Installation of monitor (3)

9. Tighten the M5x16 screw at the tail of the rear cover of the keyboard.

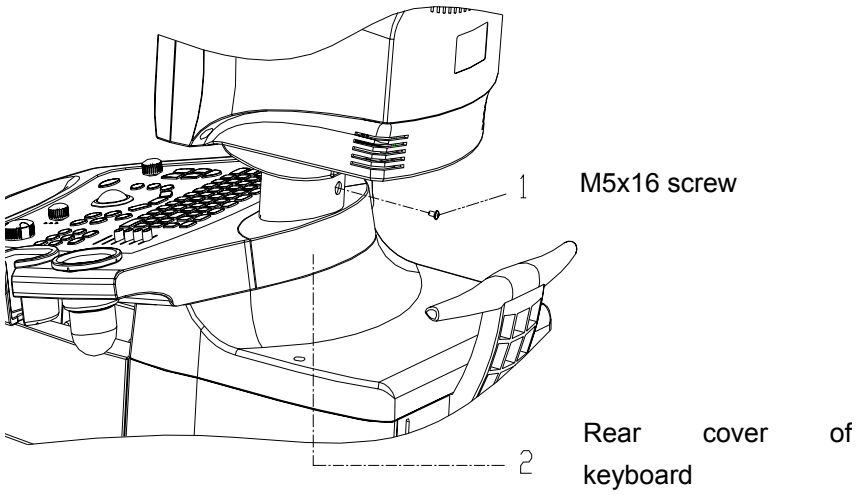


Figure 5-5 Installation of monitor (4)

5.3 Installation of Transducer Cable Hook

1. Insert the transducer cable hook assembly into the installation hole in the top plate, hold the plastic sleeve, and rotate it counterclockwise until it is stopped.

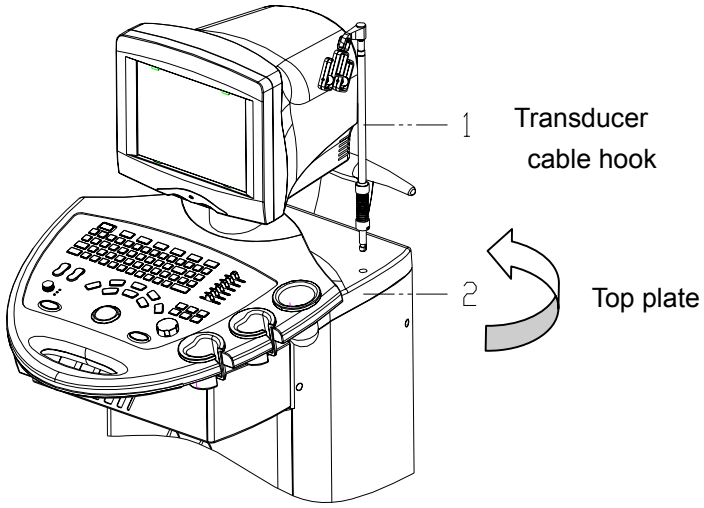


Figure 5-6 Installation of transducer cable hook

5.4 Installation of Transducer

1. Turn the lever of the transducer counterclockwise 90° to unlock the transducer. See the figure below.

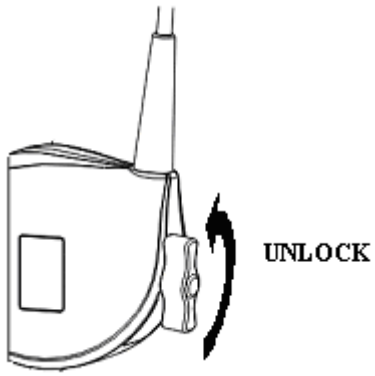


Figure 5-7 Installation of transducer (1)

2. Insert the connector of the transducer into the socket, and turn the lever clockwise 90° to lock the transducer.

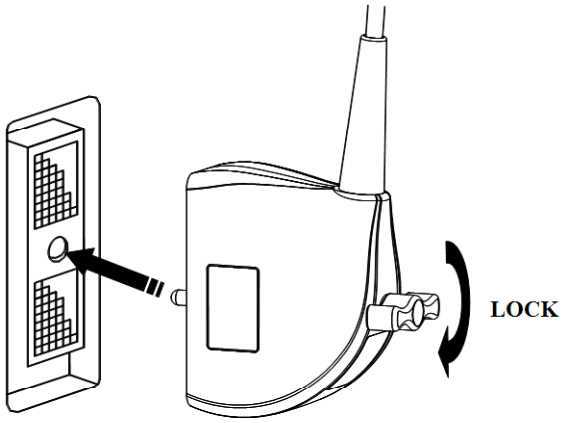


Figure 5-8 Installation of transducer (2)

5.5 Installation of Peripherals

Installation of the video printer is described as follows:

1. Remove the knurled screw under the printer compartment, and move the rear cover of the printer upwards to remove it.
2. Place the video printer in the compartment and connect the cables.
3. Reinstall the rear cover of the printer and knurled screw.

Different screws are needed depending upon the types of video printers.

SONY UP-895MD: M3x12 screw;

SONY UP-897MD and MITSUBISHI P93W: M3X6 screw.

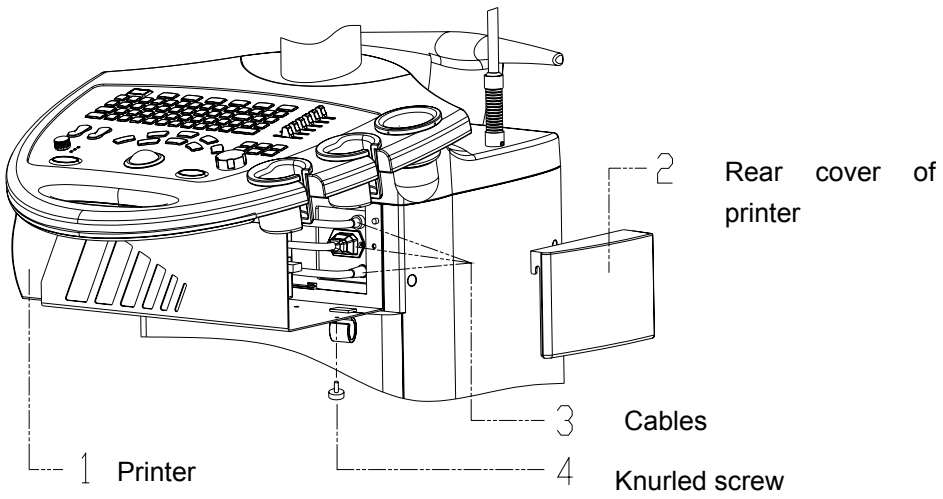


Figure 5-9 Installation of video printer

6 Installation of DP-9900Plus/DP-9900/DP-9600 Systems

6.1 Installation of Push Handle

1. Lock the four casters.
2. Take out the push handle and three sets of M5x35 hexagon socket screws and washers, and use the hexagon wrench to fix the push handle on the system.

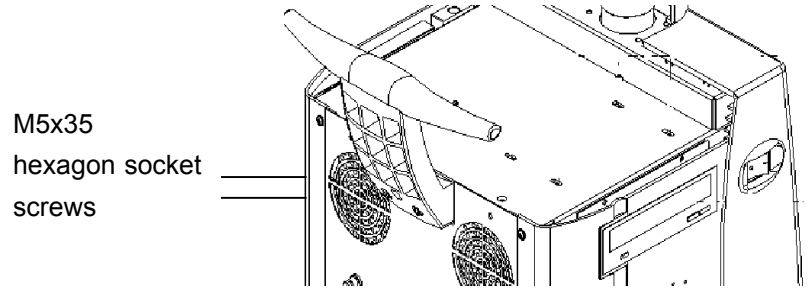


Figure 6-1 Installation of push handle

6.2 Installation of Monitor

1. Press down the buckle to remove the neck cover and place it on the rear cover of the keyboard.

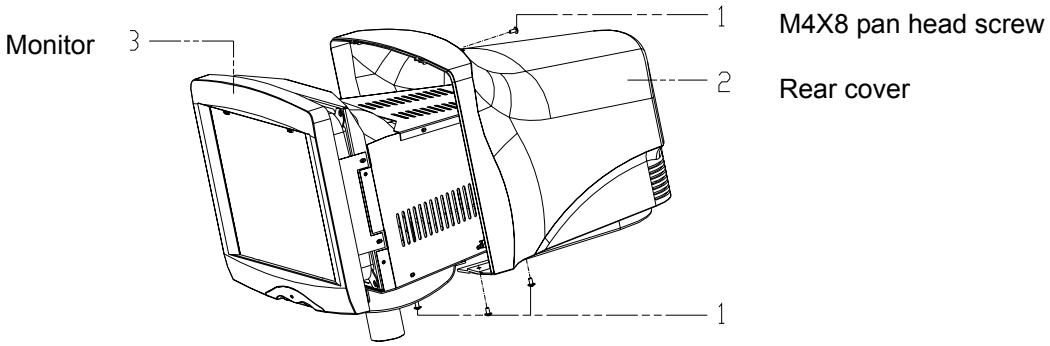


Figure 6-2 Installation of monitor (1)

2. Remove the two screws from the bottom of the rear cover of the monitor.
3. Stand behind the monitor, hold the two sides of the rear cover of the monitor, push down the front edge of the rear cover and pull it backward to remove the rear cover.

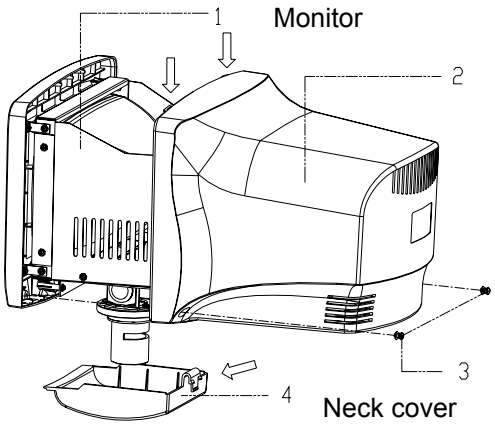


Figure 6-3 Installation of monitor (2)

4. Thread the power cable and signal cable of the monitor through the installation hole.
5. Place the support of the monitor into the sleeve on the keyboard.

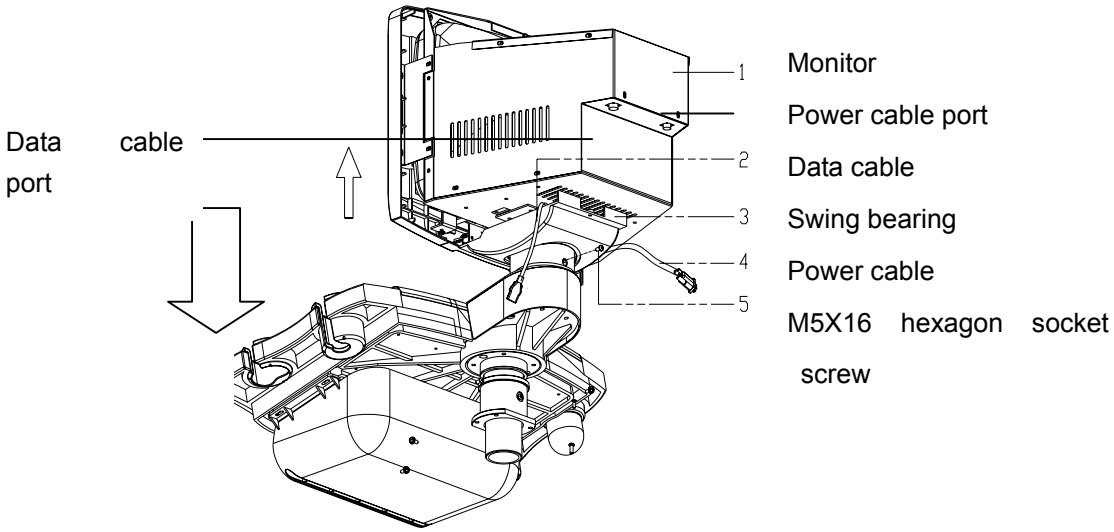


Figure 6-4 Installation of monitor (3)

6. Connect the power cable and signal cable to the corresponding ports at the back of the monitor, and tighten them by nuts.
7. Install the rear cover of the monitor and fit it with the front cover, and then tighten two M4x8 screws at the bottom of the rear cover.
8. Install the neck cover at the bottom of the front cover, and buckle it into the rear cover of

the monitor.

9. Tighten the M5x16 screw at the tail of the rear cover of the keyboard.

6.3 Installation of Transducer Cable Hook

1. Insert the transducer cable hook assembly into the installation hole in the top plate, hold the plastic sleeve, and rotate it counterclockwise until it is stopped.

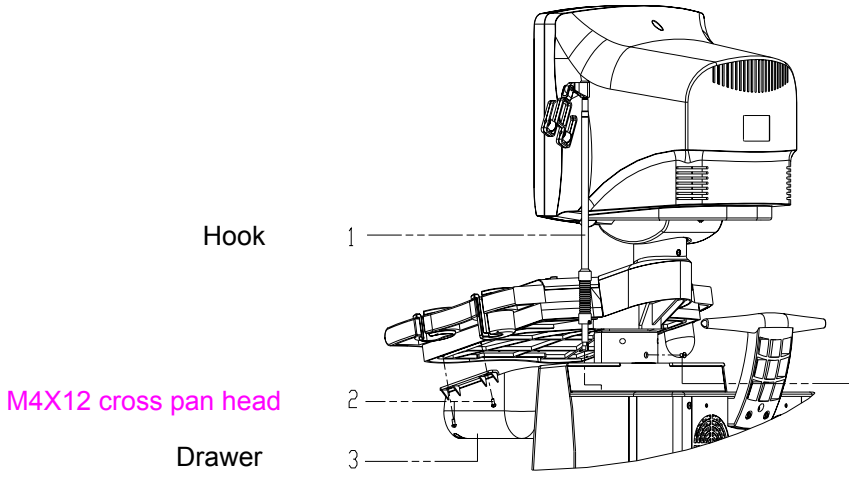


Figure 6-5 Installation of transducer cable hook

6.4 Installation of Transducer

1. Turn the lever of the transducer counterclockwise 90° to unlock the transducer. See the figure below.
2. Insert the connector of the transducer into the socket, and turn the lever clockwise 90° to lock the transducer.

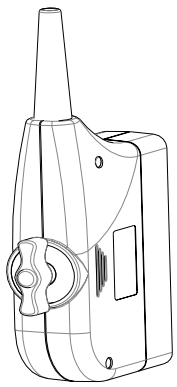


Figure 6-6 Connection of transducer

6.5 Installation of Peripherals

1. Installation of video printer

   Place the video printer on the system, and connect the printer to the main unit via power cable, VIDEO signal cable and remote control cable.

2. Installation of standard printer

   Connect the cable of the printer to the parallel port on the system. The printer is powered by the standard power supply.

7 Installation Quality Checks

Items Checked after the Completion of Installation

1. Performance and function

Table 7-1 Installation Quality Check Sheet 1

No.	Item (method)	Standard	Result [working status]	Checking method
1	Configuration	No lack of, erroneous or damaged parts	[ ] [ ]	Packing list
2	Appearance	No scratch or damage on the shell	[ ] [ ]	
3	Installation environment a） Line voltage	When the power supply unit works, its output of single-phase AC voltage shall be stable.	[ ] [ ]	Installation Manual
	b) Grounding wire connection	The protective grounding terminals shall be correctly grounded.	[ ] [ ]	
4	Functions Functions of the control panel a） Image display	Images can be normally displayed.	[ ] [ ]	
	b） Function of position expansion	Images can be normally moved.	[ ] [ ]	
	c） Function of measurement	Distance can be normally measured.	[ ] [ ]	
	d） Body mark display	Body marks can be normally displayed.	[ ] [ ]	
	e） Keyboard input	Characters can be normally inputted by the keyboard.	[ ] [ ]	

	f） initial setup press	The system setup shall be initial status.	[ ] [ ]	
	g） print	The printer can print the displayed images.	[ ] [ ]	
5	Performance Image display a） Place a screwdriver on the surface of the transducer, move it from left to right, and observe the displayed image.	The complete ultrasound image can be displayed.	[ ] [ ]	
	b） Noise in the operation status	There shall be no noise on the specific images.	[ ] [ ]	

2. Moving the machine in the hospital

Table 7-2 Installation Quality Check Sheet 2

Note: avoid moving the machine on a slope with a great fall or on the surface of carpet with long fiber.	[ ]

3. Peripherals

Table 7-3 Installation Quality Check Sheet 3

1) Record the model numbers and serial numbers of the peripheral devices. 2) Attach the actual data of peripheral devices	---------- ---------- ----------

4. Individual setup conditions

Table 7-4 Installation Quality Check Sheet 4

In terms of the individual printing data setups in the Operation Manual, record and attach these settings.	[ ]

5. Electric safety test

Confirm whether the safety tests are required.

The safety tests shall be performed if required by legal regulations or customers.

□ Required by legal regulations

□ Required by customers

□ Not required

A. Protective grounding impedance

Turn off the power of the main unit when performing measurements.

Table 7-5 Installation Quality Check Sheet 5

No	Item (method)	Standard	Result [working status]
1	From the equipotential terminal to the bigger fixing screw of the transducer hanger.	☐ refer to IEC 60601; less than 0.1 Ω ☐ refer to local regulations; less than_____Ω	[ ] Ω
2	From the bigger fixing screw of the transducer hanger to the grounding terminal of three-wire power cable socket.	☐ refer to IEC 60601; less than 0.1 Ω ☐ refer to local regulations; less than_____Ω	[ ] Ω

B. Ground leakage current

Turn on the power of the main unit when performing measurements.

Table 7-6 Installation Quality Check Sheet 6

No	Item (method)	Standard	Result [working status]
1	Insert the three-wire power cable into the power outlet of the safety tester.	normal status 0.5mA or less	normal status [ ] mA

C. Enclosure leakage current

Turn on the power of the main unit when performing measurements.

Table 7-7 Installation Quality Check Sheet 7

No	Item (method)	Standard	Result [working status]
1	Use the test pen of the safety tester to connect the bigger fixing screw of the transducer hanger to the testing device, and insert the three-wire power cable into the power outlet of the safety tester.	normal status 0.1mA or less	normal status [ ] mA

D. Patient leakage current I

Turn on the power of the main unit when performing measurements.

Table 7-8 Installation Quality Check Sheet 8

No	Item (method)	Standard	Result [working status]
1	Wrap the transducer with aluminum foil and put it into a vessel filled with physiological saline water. Connect the aluminum foil to the A point of the tested device, and insert the three-wire power cable into the power outlet of the safety tester.	☐ refer to IEC 60601; AC less than 0.1 mA, DC less than 0.01 mA. ☐ refer to local regulations; AC less than_____mA, DC less than___ mA.	normal status AC [ ] mA DC [ ] mA

6. Under the condition of normal power input polarity A (normal condition A), measure the ground leakage current, enclosure leakage current and patient leakage current. After cutting off the system power, under the condition of reversed power input polarity (normal condition B), measure the ground leakage current, enclosure leakage current and patient leakage current.

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